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CREATIVE IMAGINATION

By RAY M. SIMPSON, A.M. (Harvard)

I. IMPORTANCE OF THE SUBJECT

"The blunt truth is, that after three years' association with amateur writers, we are convinced that only a small percentage are naturally gifted with the two vital elements of success—creative imagination and dramatic insight." This quotation, taken from a letter received from Mr. Roy Manker, Vice President of the Palmer Photoplay Corporation, shows the great importance that a business man attaches to creative ability.

Creative imagination is worth more than mere book knowledge. Education and intelligence are merely the means by which we facilitate the liberation of this creative energy. Modern psychologists have failed to place the proper emphasis upon this vital and important factor in the life of the individual and in the fibre of our society. Titchener has been the most generous in offering suggestions upon the subject, as is evidenced by the fact that he has devoted three pages to the imaginative consciousness in his Text Book on Psychology. Wundt speaks of "Creative Synthesis" and "Creative Resultants," which are most fertile as suggestions, but which he drops with his customary propriety. The Behavioristic School naturally overlooks imaginative tendencies. Watson in his latest book on Psychology does not even mention the term "imagination."

It is not our purpose in this article to ascertain how imagination originates, but to deal only with ways and means of measuring it. Certain types of incidental or promiscuous education may develop it more readily than specialized training. The extraordinary produces the extraordinary. Productive freaks are the exception and not the rule.

Tests devised to ascertain either native intelligence or acquired knowledge are certainly valuable to an employer. However, they can only give a clue to the individual's possible expansion in so far as certain tendencies and capacities have been seen to evolve from other individuals possessing the same intellectual status. Individual differences make the index of these tests most uncertain. There are no elements in them to extract from the mind of the individual his powers of creative

productivity and his tendencies toward originality. If his creative ability is expressed in many of these tests, the methods of scoring have failed to take it into consideration. It is evident that we need tests designed to give us more direct and dependable information upon this essential element of progress—creative imagination.

II. HOW CREATIVE IMAGINATION MAY BE DETECTED

Creative ability is marked by the initiative which one evidences by his power to break away from the usual sequence of thought into an altogether different thought. Progress is made by the realization of limitations. When these limitations are recognized, then a new approach is sought for an explanation of the problem confronting us—or should be sought.

Frequency of spontaneity in thought is the true measure of a person's creative capacities. A person might be pregnant with new combinations of ideas, and yet they would not have any special significance as being useful, artistic or unique. We are looking for deviation, not necessarily the utility of the creation or the beauty of a design. Creative ability is evidenced in one's tendencies to abandon old unfruitful paths for others. A searching type of mind, a combing mind, a synthetic mind is what we are looking for.

The number of figures drawn within 15 min. is no index of a person's creative imagination. This gives merely his speed in production. It has no quantitative or qualitative significance. The number of departures from following a previous figure in its form or utility, however, marks that quality of mind that is original and searching.

Initiative of deviation is for our purpose, then, accepted as the measure of a man's creative ability. This deviation may be either evolutionary or spontaneous. It may involve either mechanical production or inspired production. People vary as to initiative. The nervous individual, possessing aesthetic tastes and sensitive feelings, may possess more initiative or liberate more energy than the indifferent calm thinker. But initiative towards one's task is certainly no mark or evidence of constructive ability and originality. It is true that this may be a valuable asset to a creative mind, however, because of the facility which it engenders.

Now, what motivates these deviations? Ambition, that intangible incentive to action which looks forward to satisfaction, is absolutely necessary. Hedonistic motives no doubt exercise the predominant developmental urge.

All creations, such as novels, inventions, poems, etc., may be placed in one of the two categories—labored or inspired. Some

geniuses flower in a day, while others are destined to years of hard, tiresome labor and effort before their dreams are realized. We are walking along the street and an idea suddenly springs into our consciousness. It is new in the sense that it is unique. There is never anything absolutely new created. New ideas represent merely new combinations of thought-elements, of which there is an infinite number of combinations. Maxwell Garnett, in his new book on "Education and World Citizenship" (1921, p. 258), gives the following interesting paragraph dealing with this point. "And, since these sudden inspirations often follow an unconscious process that has revealed a connection (or, as Poincaré says, a 'combination') which the preceding period of conscious work failed to disclose, are we to say that there is an unconscious ego, or a subliminal ego, that is 'superior' to the conscious ego? (Both Poincaré and Dr. Morton Prince are loth to say yes.) Are we to follow Mr. Kenneth Richmond and describe the thought processes which lead to these inspirations as 'superconscious'? It is true that creative thinking, marked by the 'discovery' of valuable combinations and so making important progress towards the goal of scientific thought, is often—and perhaps only—accomplished when active consciousness is somehow side-tracked, when, in fact, the will is not intervening in the train of thought in question, and when there is no interference by extraneous thought-activities, whether due to active interest-systems or to in-coming sense-impressions." Garnett attributes our moments of inspiration to the free working of the curiosity or wonder instinct. It is true that interest may motivate our inspirations, but the inspiration itself is dependent upon many other factors besides interest.

Why are we justified in considering creative capacities as dependent upon frequency of spontaneity, initiative of deviation or absolute change? The methods and productions of all persons whom we designate as geniuses give ample proof of this assertion. Newton, Faraday, Becquerel, Roentgen, Darwin, Einstein, Edison and Madame Curie give us a representative list of scientists who certainly differ from the ordinary individual in creative originality of production. These inventive geniuses possess what we desire to call Creative Imagination. It may be applied with equal significance in all the fields of human endeavor. Mr. Arthur Hopkins' recent production of "Macbeth," with the new conceptions of stage setting as devised by Robert Edmond Jones, certainly is radically different from what we have usually experienced. Mr. Jones is a creative genius. Circumstance and environment often hinder as well as facilitate the functioning of creative ability, but cannot smother it.

III. GENIUS *vs.* INSANITY

Our method of calculating creative ability may at first seem to signify that insane persons would be the more creative. This is contrary to fact. In our estimation there are two types of disassociations, (1) creative and (2) neurotic. They differ in quality and degree. One may possess both. Lombroso's contention that genius and degeneration go hand in hand is obsolete and untrue. We prefer to refer to the similarities and speak of them as mere resemblances. "Genius resembles insanity as gold resembles brass" (Hirsch). Resemblances do not prove interdependence. At present we are planning to carry this same experiment into Psychopathic Hospitals and to determine the correlation between the normal individual and the neurotic individual with reference to their creative capacities.

Havelock Ellis tells us that "nothing in British Genius seems favorable to Lombroso's favorite theory, that genius occurs upon an epileptoid basis." "Some writers rake together cases of insane men of genius without considering what proportion they bear to sane men of genius, nor what relation their insanity bears to this genius."

The new combinations of thoughts of the insane have no significant bearing upon their past experience. Twelve deviations as expressed by a neurotic individual have an entirely different significance from the same number expressed by an individual with a sound mind. The two types fall under entirely different categories. The normal mind possesses the power of organization and the ability to realize the utility and function of its ideas while the insane person does not. Biography has warped the facts in the majority of cases of recorded insane geniuses. Freaks and seclusive types were formerly adjudged as insane. The meaning of the term has changed radically within the past two hundred years. The outstanding geniuses of today are far from being insane (Marconi, Voronoff, Edison, Carnegie). Let us hope that the influence of modern psychological methods will exact more careful consideration of mental traits in biographical records.

It is essential to record the "stability" of the individual with the results obtained by any test upon that individual. We proceed next to the test itself.

IV. TEST FOR CREATIVE IMAGINATION (VISUAL)

Purpose. To determine the creative capacity of an individual.

Material. Four small round dots, representing the four corners of a square which measures $\frac{3}{4}$ in. from dot to dot, are printed upon white paper. (It is best to have a rubber stamp made in order that they may be uniform in each figure.) Five squares are printed upon an ordinary sheet of $8\frac{1}{2} \times 11$ typewriter paper. Leave ample space about each square.

Preliminary. (For a group.) Pass out the printed material before starting to explain what is to be done. Give each individual 10 sheets of paper (50 squares). Have him write his name, age, and occupation in the upper right hand corner of the first page. If school children, have them give their grade in school. Have them lay papers aside while you give the directions.

Directions. (For a group.) "Upon each paper that I have given you there are printed several groups of dots in the form of squares. When I say 'Go' you are to add two more dots to the four, which you have in each of the printed squares, and see how many different drawings of objects, or of designs, you can make in fifteen minutes. You may place the two 'extra dots' anywhere you like. You must use every one of the six dots. You can make as many straight or curved or crooked lines as you like. Use pencil.

"Do not be too careful with your drawings. The objects must be intelligible and the designs or patterns must use the two 'extra' dots in important places in them. We know that some of you can draw better than others. That makes no difference. Originality counts for most. Strive to make as many *different* things as possible. You are searching for 'new' ideas. Try to make every one of the drawings *different*."

(Give two examples upon the black-board, showing how a dipper and a rectangle can be made by adding two dots and connecting them by lines. Be sure to make the dipper with a curved handle in order that they may see that curved lines can be used. Make it clear that they can use any kind of crooked lines.)

"Number each one of the drawings as you finish them. Remember to add two more dots to the four. You will have fifteen minutes only. Pay strict attention to your own business and do not look at your neighbor's work. The best way to find things is to keep looking at the four dots.

"READY! Go!"

(Watch the time closely. Be sure they have numbered the drawings before they hand them in.)

Questions and additional data:

1. Now some people place the two dots "by chance" anywhere within or outside of the square and then "imagine" what the outline suggests. Others first think of the thing they are going to draw, then place the two dots where they are needed to complete their picture or design. If the *thought* of the object you drew came into your mind before you placed the dots, write Yes on the back of the first page. If you used both methods write Both.
2. Write beside each figure what suggested it to you.
3. Did any of the things that you drew before have any influence upon your other drawings?
4. Did you think of the next figure that you were going to draw before you finished the previous one?
5. Which do you think is the more "creative" or original—the drawing of a geometrical wall-paper design or the drawing of an automobile?

V. HOW TO GRADE THE DATA

Give one point credit for a change of design in decorative drawings and one point credit for a change of object in representative drawings. By noting carefully the form, function, utility, shape, pattern, setting and meaning of each drawing it will be very easy to make these two main distinctions. Do not count a reproduction of the examples that were given before the experiment. Count only one letter of the alphabet and only one figure.

Geometrical figures count the same as any decorative design or representative object. The frequency of geometrical figures is about the same in all individuals. In talking with Professor Titchener about the comparative values of "designs" and of "objects," he stated that he was not certain but that the drawing of a design was more original and creative than the drawing of an object. We will not attempt to discuss this point here. We are inclined to think that they are of equal value. The artist may have a large supply of "stock" designs on hand to unload, but he is restricted to the use of only those which can utilize the two extra dots to advantage. A blacksmith, on the other hand, may have in readiness a supply of objects which he experiences with equal frequency in his work, but they are subjected to the same requirements in this test.

The total number of drawings made is not significant. If a person drew forty houses all practically alike he certainly would not be considered as "creative". Another may draw only five designs each of which has the same shape or form. We would score each with a zero.

Suppose Mr. X. made six drawings which were entirely different (man—house—boat—flower—fylfot symbol—butterfly), and Mr. Z. made thirty drawings of which only fifteen were entirely different. Mr. Z. would be considered more creative because he has given us fifteen changes while Mr. X. has given us only five. But what of the quality?

How are we to determine which is of more creative significance—a typewriter or a Rembrandt painting? How are we to differentiate between the creative abilities or creative capacities of a Goethe or a Schiller except by merely designating them as either active or passive? Who is the greater genius,—Plato or Bach? We are not dealing with qualitative distinctions in this test. We merely hope to ascertain quantitative creative values. The difficulties to be confronted in either case are extremely complex. The social significance or utility of a patent determines its value. We cannot go into a thorough discussion of this matter here, but will make that clear in a later paper. Quality depends to a great extent upon conditions external to the individual, upon education and environment. We are not testing the "product" but the "capacity" to produce original ideas. The fast thinker gives evidence of his speed in the greater number of figures that he draws, but bear in mind that there is greater chance of having many drawings alike where more are made than where few are made. College students in the Harvard Laboratory tended to make fewer figures and to get them all different, while the children in the grades draw a greater number of figures and get probably only half of them different.

Speed gives us no evidence. It merely signifies a difference

in method in creative production. While the fast thinker is drawing three or four similar drawings that only count for one point credit, the slow thinker is generally producing one figure that also counts for one point credit.

At first we attempted to collect the total number of figures made and unite it with the number of creative changes, stating both in a percentage. To secure this percentage we divided the number of creative changes (C.C.) by the total number of figures drawn. According to this method of figuring, an individual who made 5 figures, 3 of which were entirely different (60%), would make the same score as another who made 30 figures with 18 changes (60%). Here we have three creative changes in one individual equal to eighteen creative changes in another. Suppose Mr. A. made 15 figures with 14 changes (93%); Mr. B. made 22 figures with 21 changes (95%); Mr. C. made 15 figures with one change (6.6%); and Mr. D. made 22 figures with one change (4.5%). One can readily see that the value of the changes is here dependent upon the total number made. Our emphasis is upon the "changes", not upon the number of drawings.

VI. VALUE IN SCHOOLS

In April (1921) this test for Creative Imagination was given to 407 children in the Public Schools of Oyster Bay, Long Island. Mr. B. E. Whittaker, Supt. of Schools at Oyster Bay, gave generously of his time and energy in aiding with the testing. The tests were given first in the eighth grade and then carried successively through the intervening grades down through grade 3 B. We started with the eighth grade in order to familiarize ourselves with the procedure before we approached the lower grades. Every effort was made to be sure that the procedure was well understood by all the pupils before starting. Language was adopted which they could understand. No essential deviation was made from directions as given above.

Following is a brief summary of the results obtained.

Grade	No. of pupils	Total No. of Figs. Drawn	Av. No. of Figs. Drawn	Total Crea- tive changes	Average C. C.
3B	45	965	21.4	196	4.35
3A	39	721	18.4	276	7.05
4B	38	652	17.1	174	4.5
4A	39	734	18.8	379	9.7
5B	40	1067	26.6	349	8.7
5A	37	703	19.0	352	9.5
6B	34	578	17.0	372	10.9
6A	38	779	20.5	429	11.28
7B	36	566	15.7	349	9.6
7A	30	542	18.06	295	9.8
8	31	421	13.5	190	6.1
Total	407	7708		3361	
Average			18.9		8.25

These pupils ranged in age from 7 to 16 years. Each of the 407 tested had studied drawing. The finding which was of most importance to us was the average number of creative changes for the entire school. This average was 8.25. By comparing the number of creative changes of each individual with this average we have a basis for comparative judgments. Anybody who falls below this average is considered low in creative capacity, while anybody who ranks above 8.25 is rated accordingly.

In every grade, room A proved to be more creative than room B of the same grade. This seems to signify that Oyster Bay has a well graded school. Grade 6A has the highest average, with 11.28 creative changes. The budding genius of the 407 pupils was Edward M., 13 years old, in the sixth grade.¹ He drew 42 figures and had 27 perfect changes. Thirteen of his drawings were of objects.

These tests serve to indicate in a concrete way the latent capacities of each pupil. The task of the teacher then is to study the "interests" of the pupil and place him where he can develop his talents. If he is stupid in arithmetic, then try him in history. If backward in history, then try him in music or drawing. All must undergo a certain amount of the constraint of the school, however. It is evident that Edward M. possesses this "vital stuff" of life which we call "creative energy" and it is the duty of the teacher to direct its liberation into fruitful channels.

Those below the average can be of value to the community only as "reproducers" and probably will fare better in life than those above the average in creative imagination. Those above this average we term "producers"—those who bequeath something to civilization in services. The average business man who is successful may possess very little "creative imagination." True business ingenuity, however, lies in one's powers to visualize situations and in the creative impulse to react to productive opportunities.

VII. DEVELOPMENT OF THE TEST

At first we used 15 dots placed promiscuously upon a sheet of paper, and instructed the subjects to find as many "detailed objects or designs" as possible among them within 45 minutes.

¹Mr. Whittaker says: "Many of those who made high scores may be classified as day-dreamers. Edward M. is about a 75% or 80% student in the usual school subjects. He is a special type and his case is difficult of analysis. He seems to have no strong likes or dislikes and no prominent interests, is not a movie fan, is not inclined to join with the other boys in vigorous plays, is not a great reader of stories or novels. Yet he has a very active imagination, exemplified in the peculiar kinks in his own expressions and ideas and his keen appreciation of new ideas expressed by other pupils. In the case of several others who made high scores, they are what one might call "shut-ins"—who for one reason or another have taken most of their play and recreation through imagination."

Three weeks of this procedure got us nowhere, because the setting was too complex and it was impossible to score the results. We then had the subjects make "one unified object" out of the 15 dots. Again it proved too complex for analysis, and eliminated creative design. We were also baffled with qualitative distinctions. There was only one thing left to do if we were to retain this method of approaching the problem, and that was to reduce the number of dots. Accordingly we took 6 dots and instructed the subjects to "make as many different drawings of designs or objects as possible by adding two dots to the six already given." The time was reduced from 45 to 15 minutes. This did not prove entirely satisfactory, because the six dots were too suggestive of definite contours of familiar common objects. To eliminate most of this we finally adopted the four-dot square as offering least suggestion and giving greater control in scoring. By giving the subject the freedom of placing the two "extra" dots anywhere he liked, and permitting him to use any kind of lines in making the drawings, ample opportunity was offered for the expression of his creative ingenuity.

The four-dot method is more tangible than a mere free association test, because it slows up the thinking process and gives more direct conscious attention to the evolving of a new idea. The pictured presentation of an idea gives us better ground for scientific investigation. We attempted to use the free association test by having the subject write as many words as possible within 15 minutes and then go through the list searching for the number of distinctly new ideas as they appeared. We had the subject go over his own list and state just where the breaks came in his thinking process while writing the list. Again we were swamped with complexities. There are certain possibilities, however, in this method. It is most difficult to ascertain the creative breaks in a list of free associated words.

All these preliminary experiments were given to four psychologically trained students in the department of Psychology in the Harvard Laboratory. One of the subjects was an artist and another was an instructor of Psychology in the Department. The other two were Seniors in Radcliffe College.

The artist proved to be most creative. She averaged 25.6 in the number of figures produced, and 22.8 in the number of "Creative Changes." The averages in the number of "Creative Changes" for the other three subjects were 15, 11.5, and 5, respectively. The number of figures drawn in 15 min. by these four subjects at their first trial with the four-dot method was 26, 18, 16, and 8. This gave an average of 17—being 1.9 lower than the average for the grade-school children given above. The number of "Creative Changes" for these four subjects at their first trial was 22, 15, 9, and 7, respectively. The average

of their "Creative Changes" was 13.2—being 4.75 greater than the average Creative Imagination of the 407 school-children. We make comparisons with the first trials only, because this eliminates any facility in performance gained through the subsequent trials. After four weeks' practice of one 15 min. period once each week, allowing the subject to repeat each week if he desired, we found that the averages were raised only about .5 in each case. This increase was almost constant in each subject.

VIII. CONCLUSION

To those who fail to recognize the value of this test as a method for the measurement of "Creative Imagination," we would merely suggest that possibly they could utilize the method to advantage in studying pure imagination. Our work thus far has been a play with method rather than with the solution of the problem. We believe, however, that our method is fundamental.

By joining a creative test such as we have outlined, with a "reproductive" test such as any general intelligence test, we shall get a more accurate statement of the worth of an individual. The intelligence test alone does not evaluate this vital "Creative Energy."

The test we have outlined deals primarily with a visual imagery stimulus to creative action. Probably some people would prove more creative in responding to an auditory stimulus. Some will remind us that this type of experiment does not draw out the potential "logical" creative capacities of an individual. We hold that it does. What could be more empty than four dots without any logical significance? It is true that we get an image of some object that we desire to draw, but the whole thinking process is involved in forming this image or association of neurograms. Visual imagery generally expands into scraps of kinaesthesia, auditory imagery and personal, organic or verbal references. Logical creative performance involves imagery. All imagery involves logical creative capacities. In the April issue of the *American Journal of Psychology* (1921), in an article by Claire Comstock on "Relevance of Imagery to Processes of Thought," we find the conclusion that "there is no irrelevant imagery."

This test gives equal chance of expression to the "dreamer of dreams" and the planner, the moulder and the constructor. The stream of imagination always flows in a determinate direction. One may think at first that a mere visual imagery process is of more value in finding artists than in finding lawyers. We must not fail to recognize, however, the transition which this "image" must undergo in being given symbolical representation in these drawings. The constructive mental mechanism of free association is supplemented by motor habit.